

### REMARKS

Claims 19-26, 31, 32, and 34-36, of which claim 19 is independent in form, are presented for examination.

The Examiner has objected to the Reply to Office Action mailed on April 28, 2005, under 35 U.S.C. § 132, as introducing new matter into the disclosure. Furthermore, the Examiner has rejected claims 19-26, 31, 32, and 34-36 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 19-26, 31, 32, and 34-36 cover a primary electrochemical cell including a cathode containing an aluminum current collector, an anode, and an electrolyte containing a lithium perchlorate salt and a lithium salt selected from lithium trifluoromethanesulfonate, lithium trifluoromethanesulfonimide, and lithium hexafluorophosphate. The molarity of lithium ions in the electrolyte is equal to the sum of the molarity of perchlorate ions in the electrolyte and the molarity of trifluoromethanesulfonate ions, trifluoromethanesulfonimide ions, or hexafluorophosphate ions in the electrolyte. According to the Examiner, the underlined subject matter is not supported by the original disclosure. (See January 31, 2005 Office Action, pages 1-2.)

Applicants have submitted a Declaration of Michael Pozin Under 37 C.F.R. § 1.132 ("the Declaration") concurrently with this Reply. Mr. Pozin has worked in the battery field for over 20 years. The Declaration shows that the specification as filed actually does disclose the above limitation. In particular, Mr. Pozin explains:

3. I have reviewed the above-identified patent application, which describes the following electrochemical cell:

Referring to Fig. 1, an electrochemical cell 10 includes an anode 12 in electrical contact with a negative lead 14, a cathode 16 in electrical contact with a positive lead 18, a separator 20 and an

electrolytic solution. Anode 12, cathode 16, separator 20 and the electrolytic solution are contained within a case 22. The electrolytic solution includes a solvent system and a salt that is at least partially dissolved in the solvent system.

Cathode 16 includes an active cathode material, which is generally coated on the cathode current collector. The current collector is generally titanium, stainless steel, nickel, aluminum, or an aluminum alloy, e.g., aluminum foil. The active material can be, e.g., a metal oxide, halide, or chalcogenide; alternatively, the active material can be sulfur, an organosulfur polymer, or a conducting polymer. Specific examples include  $\text{MnO}_2$ ,  $\text{V}_2\text{O}_5$ ,  $\text{CoF}_3$ ,  $\text{MoS}_2$ ,  $\text{FeS}_2$ ,  $\text{SOCl}_2$ ,  $\text{MoO}_3$ , S,  $(\text{C}_6\text{H}_5\text{N})_n$ ,  $(\text{S}_3\text{N}_2)_n$ , where n is at least 2. The active material can also be a carbon monofluoride. An example is a compound having the formula  $\text{CF}_x$ , where x is 0.5 to 1.0. The active material can be mixed with a conductive material such as carbon and a binder such as polytetrafluoroethylene (PTFE). An example of a cathode is one that includes aluminum foil coated with  $\text{MnO}_2$ . The cathode can be prepared as described in U.S. Patent No. 4,279,972.

Anode 12 can consist of an active anode material, usually in the form of an alkali metal, e.g., Li, Na, K, or an alkaline earth metal, e.g., Ca, Mg. The anode can also consist of alloys of alkali metals and alkaline earth metals or alloys of alkali metals and Al. The anode can be used with or without a substrate. The anode also can consist of an active anode material and a binder. In this case an active anode material can include carbon, graphite, an acetylenic mesophase carbon, coke, a metal oxide and/or a lithiated metal oxide. The binder can be, for example, PTFE. The active anode material and binder can be mixed to form a paste which can be applied to the substrate of anode 12.

Separator 20 can be formed of any of the standard separator materials used in nonaqueous electrochemical cells. For example, separator 20 can be formed of polypropylene, (e.g., nonwoven polypropylene or microporous polypropylene), polyethylene, and/or a polysulfone.

The electrolyte can be in liquid, solid or gel (polymer) form. The electrolyte can contain an organic solvent such as propylene carbonate (PC), ethylene carbonate (EC), dimethoxyethane

(DME), dioxolane (DO), tetrahydrofuran (THF), acetonitrile ( $\text{CH}_3\text{CN}$ ), gamma-butyrolactone, diethyl carbonate (DEC), dimethyl carbonate (DMC), ethyl methyl carbonate (EMC) dimethylsulfoxide (DMSO) methyl acetate (MA), methyl formate (MF), sulfolane or combinations thereof. The electrolyte can alternatively contain an inorganic solvent such as  $\text{SO}_2$  or  $\text{SOCl}_2$ . The electrolyte also contains a lithium salt such as lithium trifluoromethanesulfonate (LiTFS) or lithium trifluoromethanesulfonimide (LiTFSI), or a combination thereof. Additional lithium salts that can be included are listed in U.S. Patent No. 5,595,841, which is hereby incorporated by reference in its entirety. In some embodiments, the electrolyte may contain  $\text{LiPF}_6$ ; in other embodiments, the electrolyte is essentially free of  $\text{LiPF}_6$ . The electrolyte also contains a perchlorate salt, which inhibits corrosion in the cell. Examples of suitable salts include lithium, barium, calcium, aluminum, sodium, potassium, magnesium, copper, zinc, ammonium, and tetrabutylammonium perchlorates. Generally, at least 500 ppm by weight of the perchlorate salt is used; this ensures that there is enough salt to suppress corrosion. In addition, less than about 20,000 by weight of the perchlorate salt is generally used. If too much perchlorate salt is used, the cell can be internally shorted under certain conditions during use. (Application, page 4, line 10 — page 5, line 22.)

When lithium perchlorate, lithium trifluoromethanesulfonate, lithium trifluoromethanesulfonimide, and/or lithium hexafluorophosphate are the only lithium and/or perchlorate salts that have been added to the electrolyte, the molarity of lithium ions in the electrolyte of this cell prior to discharge can be equal to the sum of the molarity of perchlorate ions in the electrolyte and the molarity of trifluoromethanesulfonate ions, trifluoromethanesulfonimide ions, or hexafluorophosphate ions in the electrolyte.

4. Additionally, several of the electrochemical cells in Example 1 of the above-identified patent application were prepared by adding a lithium perchlorate salt to an electrolyte that included a lithium trifluoromethanesulfonate salt. (See Application, page 6, line 8 — page 8, line 30.) After the addition of both the lithium trifluoromethanesulfonate salt and the lithium perchlorate salt into the electrolyte, and before discharge of the cell, the molarity of lithium ions in the electrolyte was equal to the sum of the molarity of perchlorate ions in the electrolyte and the molarity of trifluoromethanesulfonate ions in the electrolyte. (Declaration of Michael Pozin Under 37 C.F.R. § 1.132, pages 1-2.)

In view of the Declaration and Applicants' arguments in previous communications, Applicants request that the objection to the specification under 35 U.S.C. § 132, and the rejection of claims 19-26, 31, 32, and 34-36 under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

In the Reply to Office Action mailed on April 28, 2005, Applicants stated that,

[The] molarity relationship [recited in claims 19-26, 31, 32, and 34-36] can exist, for example, when the cell has not yet been discharged, and when lithium perchlorate, lithium trifluoromethanesulfonate, lithium trifluoromethanesulfonimide, and/or lithium hexafluorophosphate are the only lithium and/or perchlorate salts that have been added to the cell electrolyte. (April 28, 2005 Reply to Office Action, page 8.)

In response to Applicants' statement, the Examiner has asserted that, "[T]he recitation 'comprising' in claim 19 is an open language that could encompass additional lithium-containing compounds." (May 23, 2005 Office Action, page 3.) While this may be true, it is irrelevant. As explained in the Declaration and in Applicants' previous communications, Applicants' specification provides a written description for the electrochemical cell covered by claim 19.

The Examiner also has claimed that in the Reply to Office Action mailed on April 28, 2005, Applicants stated that, "it is clear from Applicant's specification that the anode does not include lithium." (May 23, 2005 Office Action, page 2.) In response to this statement allegedly made by Applicants, the Examiner has asserted that, "Applicant is reminded that the limitation in the instant specification cannot be read into the claim. Claim 19 does not exclude the use of lithium as the anode in the electrochemical cell." (Id., page 3.)

But Applicants do not dispute that claim 19 does not exclude the use of lithium as the anode in the electrochemical cell. Applicants note that the Examiner has misquoted Applicants' statement. In the Reply to Office Action mailed on April 28, 2005, Applicants stated that, "it is clear from Applicants' specification that Applicants' cells can have an anode that does not include lithium." (April 28, 2005 Reply to Office Action, page 10, emphasis added.) Thus, an electrochemical cell that is covered by claims 19-26, 31, 32, and/or 34-36 may or may not include a lithium anode.

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At least for the reasons provided above, Applicants believe that claims 19-26, 31, 32, and 34-36 are in condition for allowance, which action is requested.

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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